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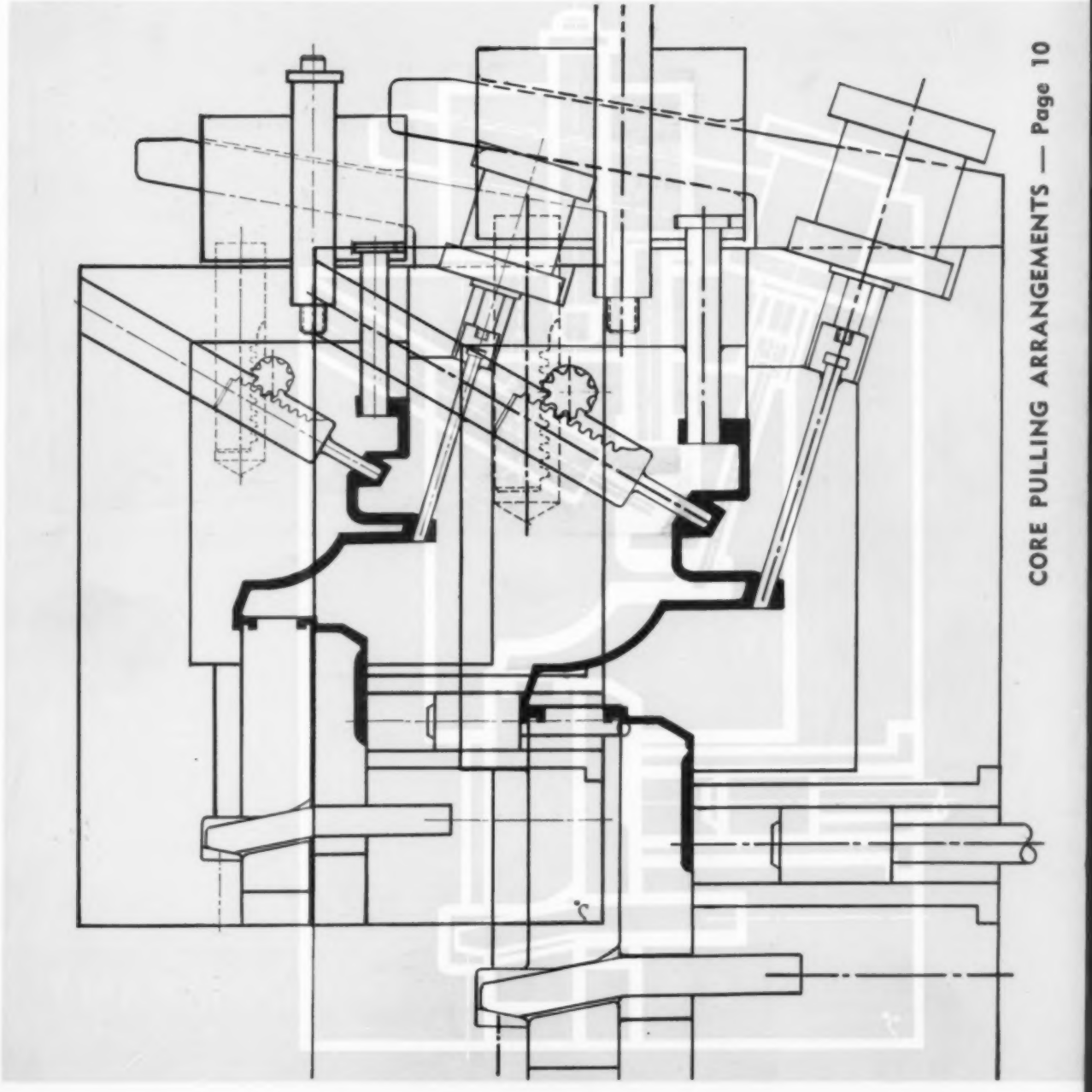
JULY, 1960



CORE PULLING ARRANGEMENTS — Page 10

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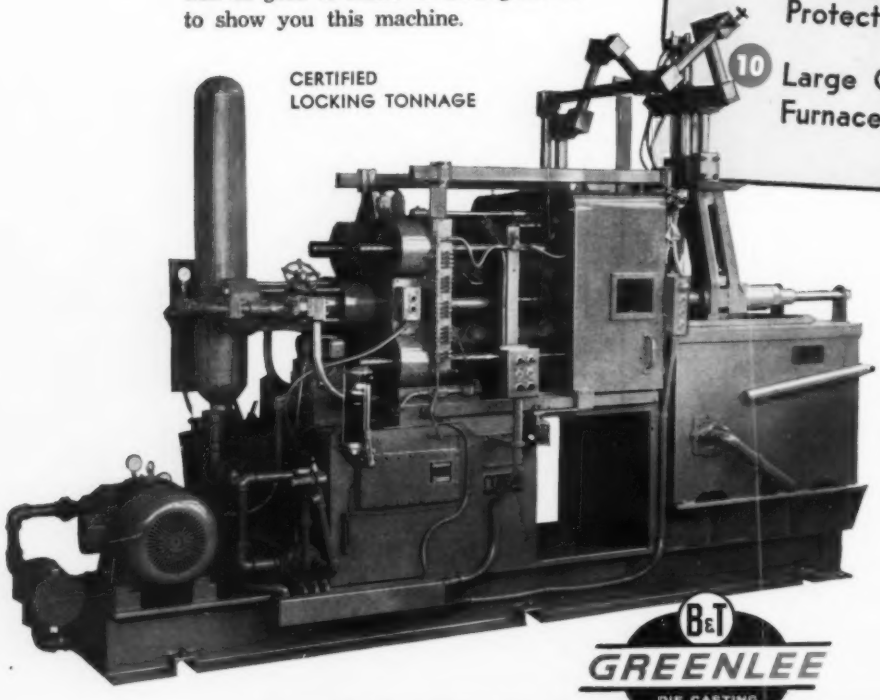

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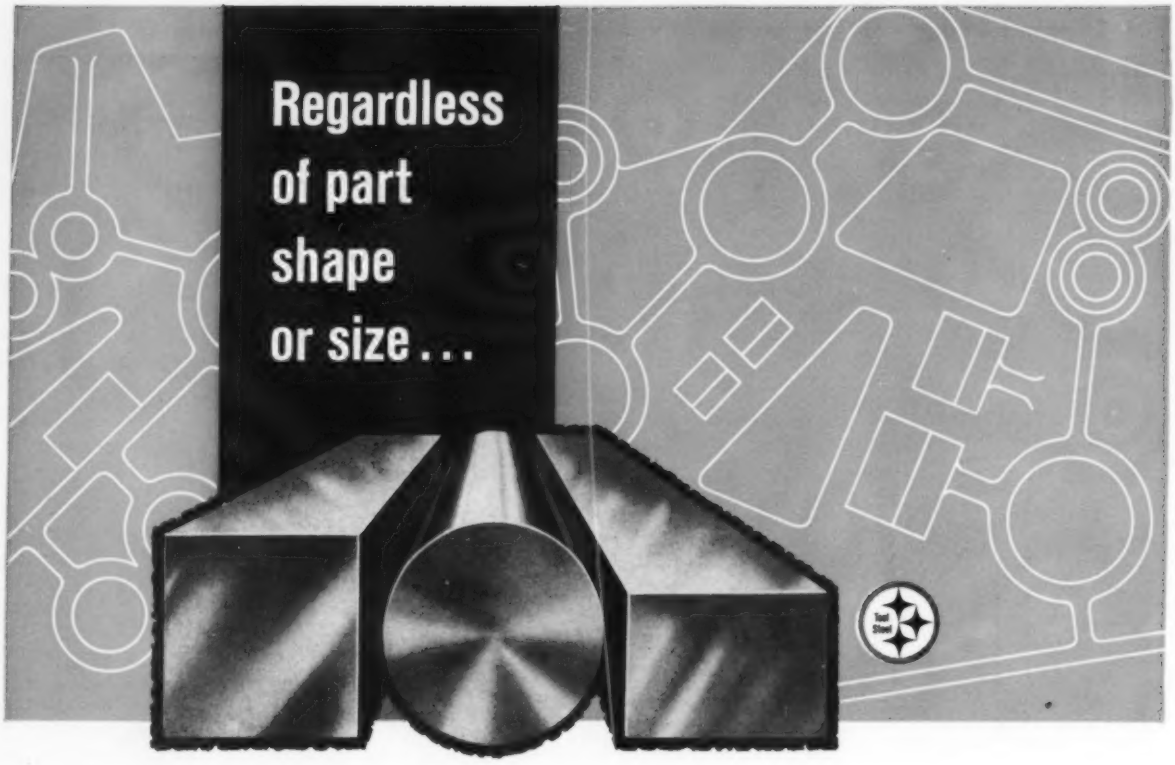

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From . . . the President's Office

The story of the Society of Die Casting Engineers has been one of continuing growth and service to our membership and our industry.

Our fiscal year ending July 1st shows a substantial growth and a strong financial position. We have experienced a 24% increase in membership since July 1st of last year and are looking forward to a much larger increase during the coming year. The Chairman of the National Membership Committee, M. A. "Mac" Nichols, and the Chapter committees, should be praised for their efforts and given your personal support. HAVE YOU INVITED A FRIEND TO BECOME A MEMBER?

The quality and response at the technical sessions of the Chapter meetings this season has impressed me. The Chapters have discontinued meetings until the fall, but are continuing Society interest at their golf outings and clam bakes. Discussions with Chapter Officers indicate beneficial sessions at the meetings this fall and winter.

Our Die Casting Exposition and Congress, to be held at the Detroit Artillery Armory, November 8-11, already is assured of being very successful. The Committee has sold a good percentage of the exhibition space and has a Technical Congress programmed, the like of which has never been presented to our industry in history.

The National Office is gearing itself for more complete service for our Members and Chapters. We are expanding our technical service and anticipate the formation of additional local Chapters.

Today's progress indicates a much stronger position for the S.D.C.E. and consequently the furthering of the aims for which we were founded. This progress is the result of the efforts of many individuals who have untiringly devoted their time and knowledge. I wish to express my appreciation to these men.

Respectfully yours,

Ollie Clayton

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An Eternal Question . . .

UNIT DIES—*an Asset or a Liability..?*

By GEORGE CENKNER
Atlantic Chemicals & Metals Co.

THE ABOVE QUESTION has been brought up in countless discussions across the country during the past years and no doubt will come up many more times in the future.

Anyone familiar with the die casting technique will probably recall his own experiences along this line. As jobs are being quoted the piece price and the tool cost must be considered. As you inquire whether you were the successful bidder on a particular job, you hear this familiar phrase, "Your piece price was O.K. but your tools, what are they—GOLD PLATED?". This, of course, starts a new flurry of activity with the pencil sharpener working overtime, and you eventually come up quoting Unit Dies.

Whether or not the Unit Die approach should be seriously considered depends largely on the anticipated use of this technique for more than one or two applications. This, of course, requires some hopeful anticipation of applications not already committed and some planning in quoting future jobs. It also poses the problem of the size and type of holder that will permit the widest application in the same master unit.

Cost of Holder Easily Offset

The master Unit Die holder represents the major initial expense in adopting the Unit Die technique for die casting. In most cases, this initial cost is easily offset by the resultant savings in subsequent die cost. In the writer's experience, savings ranging from $300 to $500 per die are easily obtained. Assuming that the master unit holder costs in the area of $3,000, it can be readily seen that six to ten applications would cover the original cost of the holder unit. While some firms assign the initial cost of the master unit as capital equipment, other shops may apportion part of the holder cost on each of the first eight or ten jobs to be run in the holder.

Although the savings in die cost is not to be minimized, since some users report savings in the area of

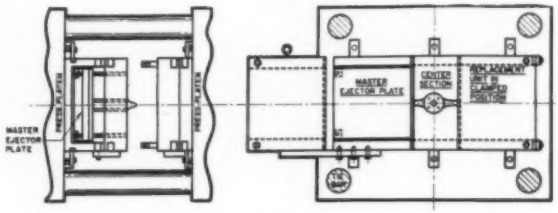

FIGURE 1—Schematic drawing showing Unit Die Holder mounted on Die Casting Machine platens with one Replacement Unit in a clamped position and one Unit being installed.

$1,000 to $2,000 per die, it is my opinion that the major advantage of the Unit Die technique lies in the reduction of machine down time when dies are changed. The Unit Die enables die changes in approximately 20 to 30 minutes compared to three or four hours for a conventional die. This can result in considerable savings in production costs, especially on medium or short-run quantities which are often the prime users of Unit Dies.

Earlier Drawbacks Overcome

Unit Dies are almost as old as the die casting industry itself, and they, too, have had their growing pains. Many improvements and modifications have been applied to the

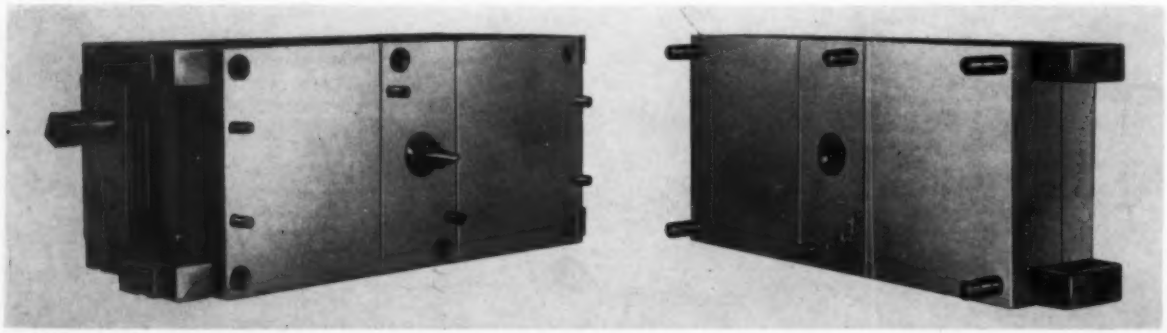

FIGURE 2—A standard Unit Die Assembly, showing the Unit Holder with the Replacement Units in a semi-installed position. (Photo courtesy Detroit Mold Engineering Co.)

Unit Die technique in recent years which have overcome some of the earlier drawbacks. The standardization of certain Unit Die designs has added serviceability as another feature to be considered.

For those who have not delved too deeply into this type of tool a description follows:

A Unit Die assembly consists of a master holding die, which is the supporting mechanism for a replaceable unit or units. The master Unit Die holder is permanently fastened to the die casting machine platens from which the units can be removed and replaced without having to dismantle the nozzle arrangement, the ejection mechanism or reset the machine. (See Fig. 1.)

The master holder is gated and water-cooled in order to apportion the casting metal to each of the units from a single gate opening.

Various Sizes and Shapes

Units are made in various sizes and can be round, square or rectangular.

The master Unit Die holder may be built for groups of two, four, six or eight units, and because of this, may range in size from quite small to very large. The size of the individual units may also vary considerably from as small as 4" square to 12" x 30".

The complete assembly (See Fig. 2.) pictured here includes:

1. The Unit Die holder with water-cooled sprue bushing, sprue spreader, leader pins and wedge clamps installed.
2. Either rack and pinion or bumper-type ejector box assembly.

CONTINUED ON PAGE 24 ■

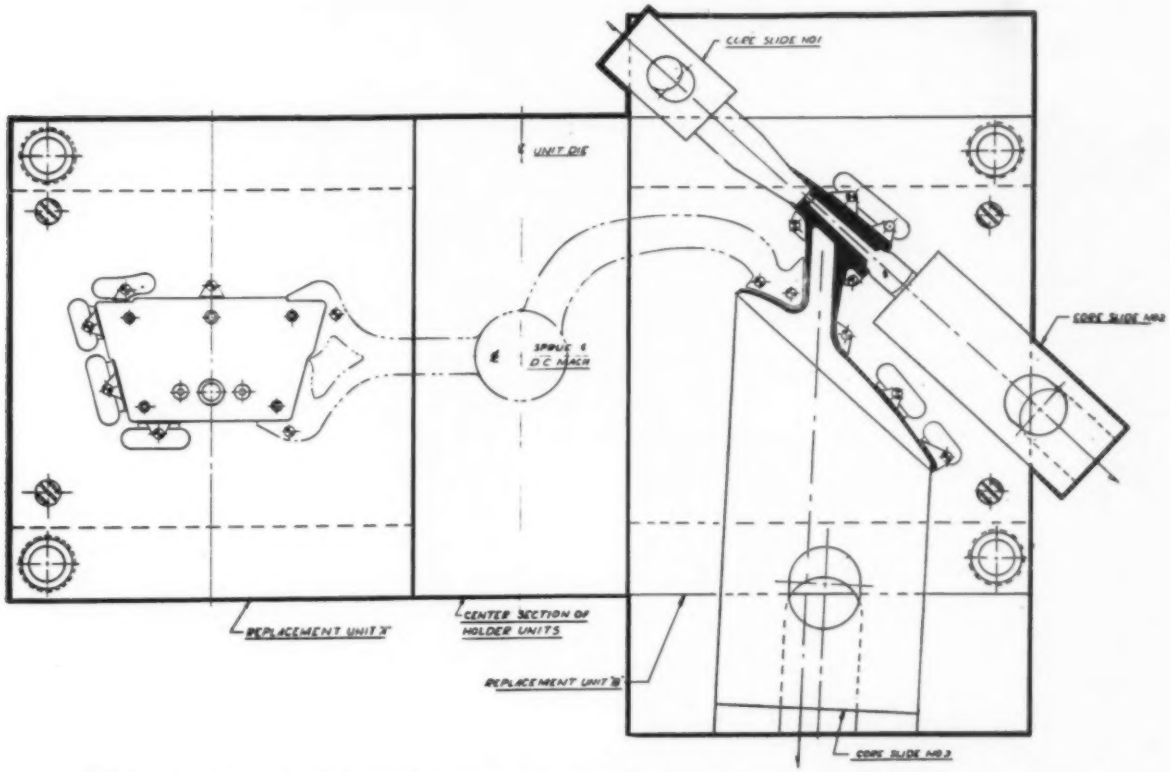

FIGURE 3—Plan view of Unit Die cavity layout, showing relatively simple part to be cast in Replacement Unit "A" and complex part with three slides to be cast in Replacement Unit "B".

About the Author

George Cenkner has spent some 25 years in the die casting industry, most recently as Diecasting Superintendent at the C. M. Hall Lamp Co. in Detroit. Prior to this he was Diecasting Supt. at Ford Motor Co.'s Monroe, Michigan plant and Chief Liaison Engineer at Ford's Automatic Transmission Div. He has also been associated with Continental Die Casting Co. and for a time was a tool and die maker. George graduated in 1931 from the Henry Ford Trade School. His experience in the construction, use and application of Unit Dies qualifies him to discuss the subject of his article. George is currently Sales Representative for Atlantic Chemicals. He is married, has four children and lives in Southfield, Michigan.

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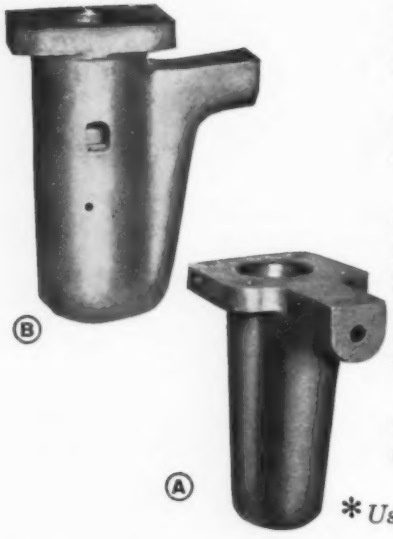

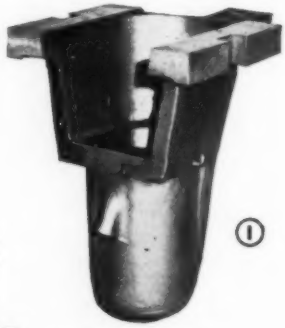

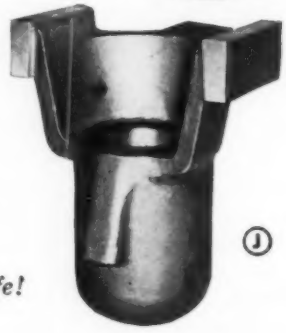

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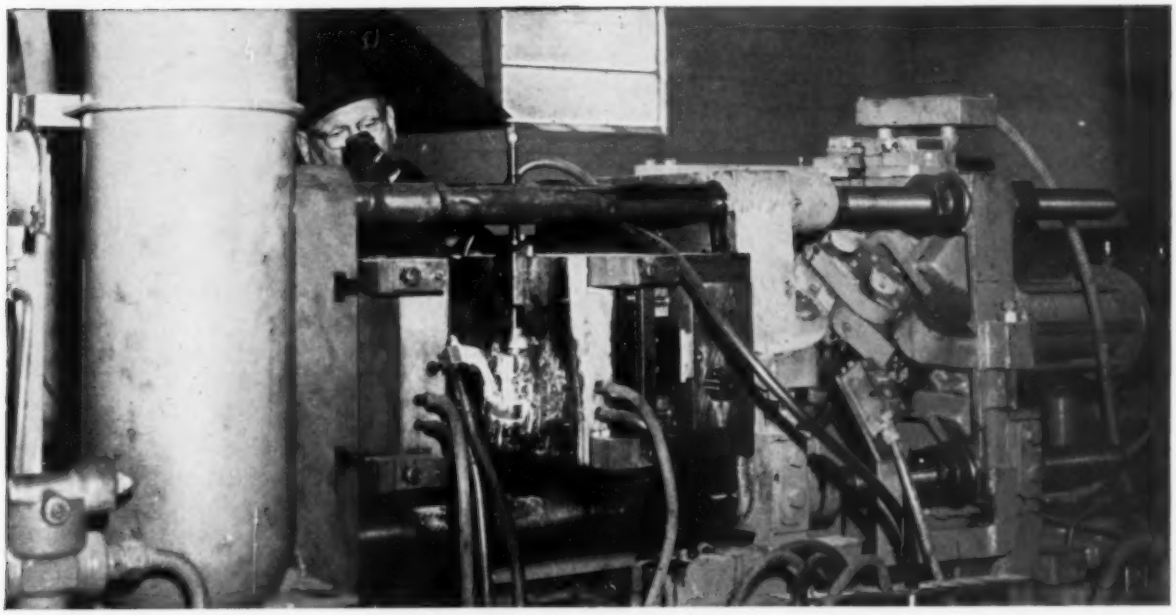

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Vital Production Factor . . .

Core Pulling Arrangements

By OLLIE CLAYTON
Owner
Clayton Engineering Co.

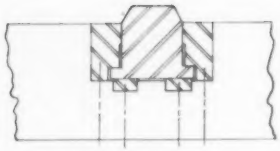


FIG. 1-A

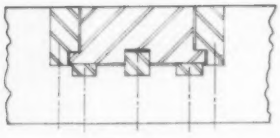


FIG. 1-B

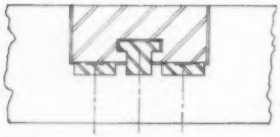


FIG. 1-C

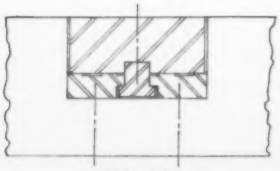


FIG. 1-D

THE EXPANSION IN THE DIE casting industry is largely attributable to the use of the process to produce larger and more complicated parts. The casting dies to produce these parts require an increasing number of sliding cores. In many instances, the area of these cores approaches or exceeds the projected area of the cavity. With the area of the sliding core ever increasing, we must design slide operating and locking mechanisms to operate freely and hold the core positively in place against the impact and final pressure of the shot.

The selection of the type of core pull and locking mechanics can affect overall production rate and casting quality. A sliding core which binds or flashes at operating temperatures causes additional maintenance, and an interruption of the casting cycle, which is so important to maintaining die temperature and resulting casting quality. We must consistently lock the core in its proper position to meet dimensional tolerances.

To illustrate various types of construction, we have separated the sliding core into three basic areas: the type of slide, the pulling mechanism, and the locking arrangement.

Type Can Vary To Suit Part

The type of sliding core pulls can vary to suit the part and the size of the core. Fig. 1 illustrates several "T" slot or gib types of construction. Gibs and wear strips may be eliminated when the production life requirement of the die is short. Fig. 1A is a conventional "T" slot construction. Figs. 1B, 1C, and 1D are center guide for wide slides where expansion allowance requirements eliminate the possibility of using the slide edges for guiding. Fig. 1D shows a center guide designed for removal of the sliding core from the parting line face, for ease of cleaning and maintenance. Fig. 2 is a sliding core which is completely enclosed (guided) in the ejector die half. This is very similar to the submarine (below the parting line surface) core shown in Fig. 3. The exterior header, sliding on its own guide pins, is used extensively for this type of coring, and for operating rack and pinion type pulls.

If a core pull is required in the cover (stationary) die, it is generally a submarine type, pulled hydraulically, with a large enough cylinder bore to provide a positive hold against the shot pressures. In the event the area of the cover die core is too large to hold or lock with the actuating cylinder, a separate hydraulically operated locking wedge is used. Whenever a cover die core pull

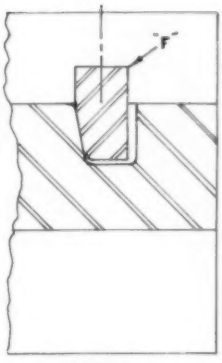


FIG. 5-A

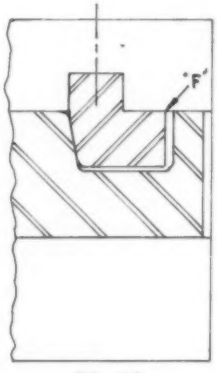


FIG. 5-B

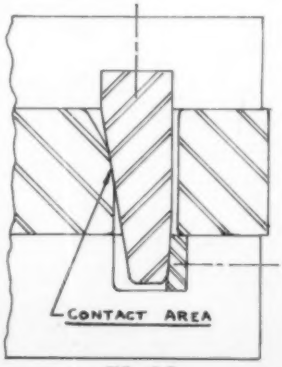


FIG. 5-C

is used it is necessary to install an electrical interlock into the circuit to prevent the machine opening before the core is pulled to a sufficient clearance.

Flexibility Important

Any of the above slides may be operated mechanically or hydraulically. Whenever a slide is operated hydraulically it is important to provide a coupling with enough flexibility, so the misalignment between the slide ways and the cylinder bore does not cause a binding action.

Clearances, expansion allowances, lubrication grooves, release tapers, and shut off tapers are items which are determined by the type of slide and the designer's experience with the caster's operating technique.

The pulling mechanism is operated manually, hydraulically, or mechanically. Cores that are pulled 90 degrees to the direction of opening are generally operated by horn pins or cams, using the motion of the machine as an actuating force. These horn pins or cams have an operating angle as required to pull the core the required distance with the stroke of the machine. Cams may have two angles, one for force, and a greater one for length of stroke. It is advisable to allow a dwell (Fig. 3) so the

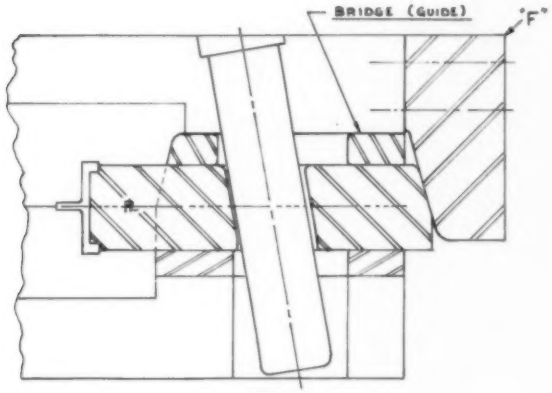


FIG. 2

core starts to pull after the initial opening of the die. Fig. 2 shows an internal horn pin type of slide cam. Fig. 3 illustrates an external slide cam with the cam also performing the duty of the lock. Slides on a parting line which angles into the cover die may be pulled effectively with cams. Wide slides which are limited in length, or have large fit allowances due to the expansion variable, may be operated with two or more cams to assure a balanced pulling action.

Rack and Pinion Pull

On core pulls which angle into the ejector, the mechanical advantage of the cam is reduced to a point where it is not effective. For these applications, a rack and pinion type of pull may be used, see Fig. 4. The pinion may be actuated by another rack operated by a conventional slide, hydraulically, or by a lever arrangement coupled to the cover die.

Except on cores of very small area it is necessary to provide a positive means of locking the core in position sufficiently to withstand the shot pressures. In deciding to core holes that require this type of pull, one must keep in mind the loss of freedom in placing ejector pins and waterlines, due to the area below the cavity required for the mechanism. This fact, and the additional die maintenance, may justify a secondary drilling operation.

Although not a common practice, there are occasions when a core pull is operated directly by a lever system. When casting internal threads, a gear arrangement is used to screw the core out of the casting.

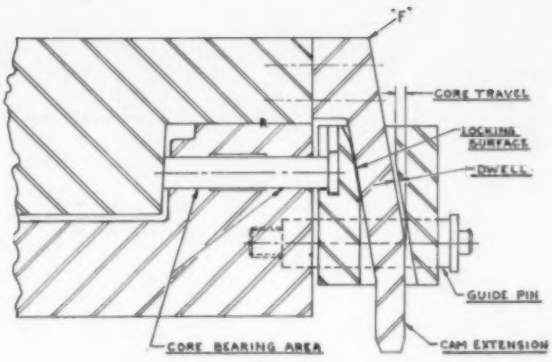


FIG. 3

Locking Arrangement Important

The locking arrangement is of utmost importance in that the lock must hold the core positively in place when the shot is made. The lock must have a cross section large enough to provide shear strength to withstand the impact and final pressures of the shot. The holder block steel supporting the lock, and the bolts holding it in place, must also have adequate strength. When determining the size and type of lock, it is important to calculate the entire area which may be exposed to the shot pressures. Many designers figure only the area exposed if the die is locked flash free. If the sliding core shut off is 90° to the direction of pull, this area must also be included in calculating total force.

There are two basic types of locks, internal and external, with many variations of each. Fig. 5A illustrates a normal internal lock. This lock may be improved without adding die steel as shown in Fig. 5B. This lock does not have any greater shear strength, but does improve the mechanical advantage of the bolts and holder block steel, due to the change of the fulcrum point under loading. To further prevent movement of the lock and the supporting steel, the lock can pilot into the ejector die on closing as shown in Fig. 5C. This lock also offers the advantage of locating your contact area of the lock nearer the center of the shot force, thereby eliminating the slight movement allowed by a top lock point and the necessary clearances of the slide ways.

Locking of Slides

To allow freedom of core pin changing and waterline location in the sliding core it is often advisable to lock the slide on the sides with two locks, or with one horseshoe shaped lock.

CONTINUED ON PAGE 23 ■

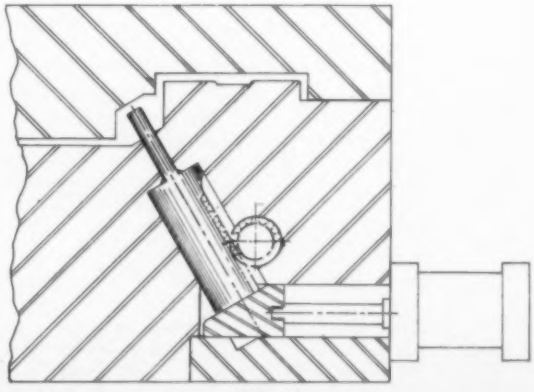


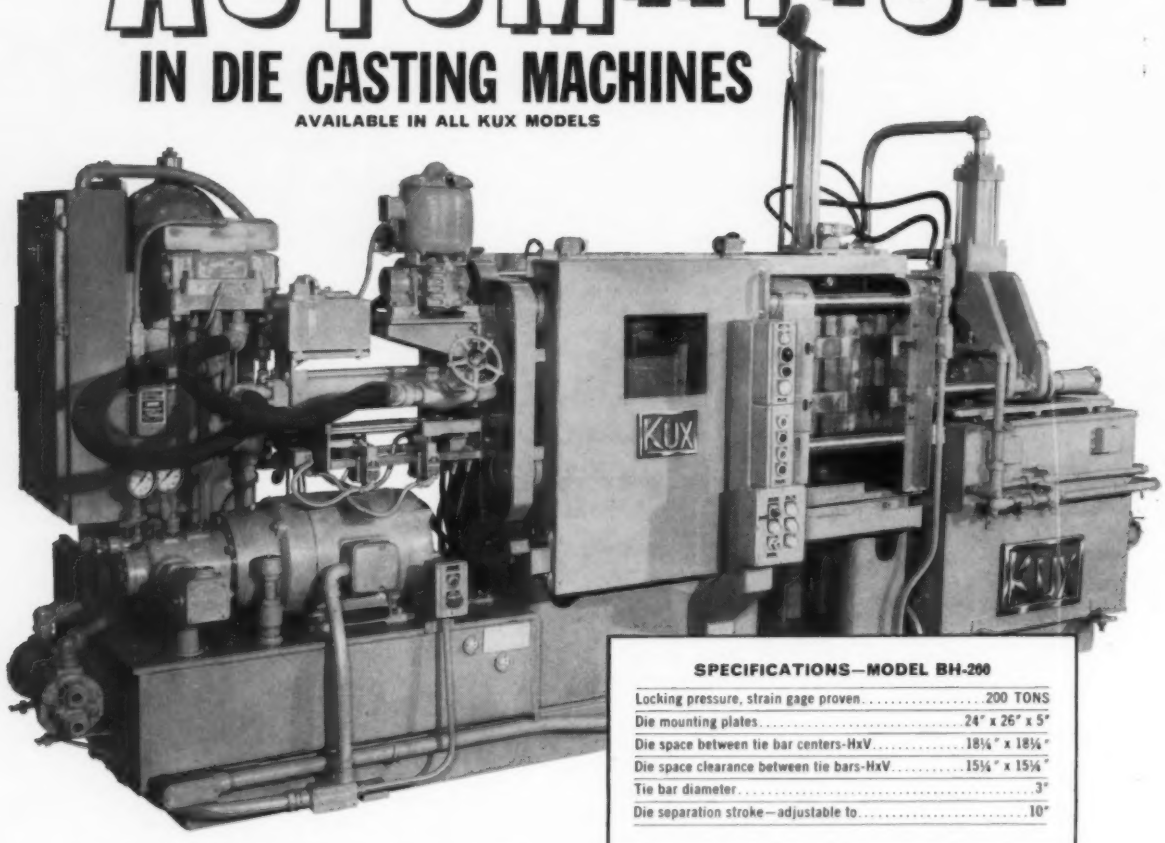
FIG. 4

Another KUX unsurpassed design superiority

AUTOMATION

IN DIE CASTING MACHINES

AVAILABLE IN ALL KUX MODELS



SPECIFICATIONS—MODEL BH-200

Locking pressure, strain gage proven	200 TONS
Die mounting plates	24" x 26" x 5"
Die space between tie bar centers-HxV	18¼" x 18¼"
Die space clearance between tie bars-HxV	15¼" x 15¼"
Tie bar diameter	3"
Die separation stroke—adjustable to	10"

Up to 900 free cycles per hour . . .
500 to 700 casting cycles per hour } AUTOMATICALLY — CONTINUOUSLY

You're looking at the new KUX Model BH200—the 200-ton strain gage proven hot chamber die casting machine, which will continuously produce vast quantities of hardware finish castings with minimum maintenance and down time. Automatic operating mechanism permits a cycle with a full 10" of die movement and 6" of metal injection stroke in 4 seconds. A 6¼ lb. zinc shot can be produced in this heavy duty machine at 1800 PSI injection pressure. Sensing safeties retract the die plate and prevent recycling of machine if there is flash on the die surfaces.

Incorporated into this machine cycling mechanism is a low pressure approach of the moveable die plate, flash sensing switches, air jets for cleaning die faces, casting sweep arm, and die lubricating unit with adjustable interval timing. Also available in cold chamber models for casting aluminum with KUX "AUTO-FEED" system of vacuum die casting.

ADDITIONAL FEATURES in the 28 all-new strain gage proven KUX models are the revolutionary "VAC-U-DIE" and "AUTO-FEED" systems of vacuum die casting—motorized die height adjustment mechanism—and the patented KUX injection pressure multiplier for cold chamber models with injection pressures up to 36,000 PSI and plunger speeds up to 12,000 inches per minute.

KUX MACHINE CO. (Dept. P)
6725 North Ridge Avenue, Chicago 26, Illinois

Write for full details of the 28 all-new KUX models illustrated in the latest KUX Die Casting Machine Catalog.

CIRCLE 6 READERS SERVICE CARD

A "Stimulating Experience"

By HARRY CAGIN
European Tour Chairman

SDCE group holding the placards of the countries visited during the European Tour and Third International Die Casting Conference in Stresa, Italy. (Photo through courtesy of S.A.S.)

SDCE European Conference Tour Declared Outstanding Success

THE SOCIETY OF DIE CASTING Engineers' European Conference Tour was an outstanding success from every point of view. The seventy-seven people forming the group were rewarded with a thorough insight into the art of die casting as practiced in Europe, as well as the opportunity to appreciate the abundant historical and cultural values of the countries that were visited (England, France, Germany, Switzerland and Italy). The experiences of the 30-day Tour made an indelible impression on the members. We will enjoy for a long time to come recollection of the warmth with which we were welcomed by European die casters, and the practical value of our visits to their plants. We will also recall with pleasure the fascination of observing and participating in different customs in different countries, dining in sidewalk cafes, viewing Europe's treasure trove of art and architecture, taking in such scenic highlights as the castles along the Rhine and the impressive snow-capped Alps. Besides our good fortune in having had the opportunity to take home so many fine memories of places and people, Nature also blessed us with perfect weather for practically the entire trip.

Conference Very Well Organized

The Third International Pressure Die Casting Conference held at Stresa in Northern Italy was an especially well-organized and presented affair attended by 375 delegates from all over the world. The high technical competence of the Conference program, the chance to discuss die casting problems with people from other countries, and the wide variety of plant visitations available, all made attendance at the Conference a most stimulating and meaningful experience.

Among the important things that we learned on this trip, and perhaps the most important, is that we really have a great deal to learn about perfecting our own industrial techniques and about the way the people live, react and behave in other countries. We have all been broadened by our experiences, and none of us is the same person as before. The idea of international exchange of visits to promote understanding is one we now have a greater appreciation for, and it is our hope that the SDCE will participate in such programs again in the future. In this connection, our National Die Casting Exposition and Congress has already attracted two European die casting machine builders as exhibitors and two acknowledged experts (from England and Switzerland) as speakers for the Technical Program. Judging by the interest shown abroad in this function, we should have the privilege of welcoming many European die casters at our Convention in Detroit this November.

Acquaintanceship Ripens Quickly

The members of the Tour came from all of the Chapters and from every part of the country and Canada. It was a pleasure to note the quickness with which the unacquainted members began acting as a group and the cameraderie that soon developed. This fall, when monthly meetings resume, you will undoubtedly be treated at each Chapter to a discussion of observations and impressions of Europe. Furthermore, the DIE CASTING ENGINEER is planning to run a series of articles discussing the technical aspects of the trip.

A tour of this scope could only have been organized and developed so successfully through such an organization as the Society of Die Casting Engineers. It is a source of considerable pride and satisfaction to me to have been associated with this most worthy endeavor.

Mounting Interest in Exposition Shown in Increased Allotments: Congress' Subjects Revealed

MOUNTING INTEREST IN THE forthcoming First National Die Casting Exposition and Congress of November 8-11 is evidenced concretely by the steadily increasing number of exhibitors, and consequent allotments of floor space.

Such constructive trends were indicated within less than three months after announcement of the show, when early exhibitors signed up for nearly half the allotted spaces in the Detroit Artillery Armory.

Meanwhile, further developments concerning the Exposition have reached their target, specifically the announcement of subjects and personnel for sessions of the Technical Congress. A list of suggestions has gone forth to authors of technical papers and the list of exhibitors—revealed in part in the Die Casting Engineer of May—has been updated to June 30.

Show Questionnaire Prepared

Finally, as a service of general interest and clarification, a Show Questionnaire has been prepared. Presented below, it contains questions and answers of interest to exhibitors and visitors at the Exposition.

Here are the subjects, program directors and session leaders for the First National Die Casting Congress as announced by Harry D. Hall and David C. Salatin, General Motors Technical Center Staff members, who are serving as program chairman and vice chairman respectively.

The technical papers presented before the 1960 National Die Casting Congress will be printed by the Society of Die Casting Engineers and distributed at the technical sessions. Following the session at which a paper is presented, the preprints will be made generally available.

Upon receipt, manuscripts become the property of the Society and will be copyrighted. Upon presentation, permission for republication must be obtained from SDCE. Certain papers may be selected for publication in the Die Casting Engineer. Other publications will be given permission to reprint papers when such requests are made in writing, and providing they meet specific rules of providing proper credits.

Show Questionnaire

1. Who is sponsoring and operating the Exposition?

The First National Die Casting Exposition and Congress is being sponsored and operated by the Society of Die Casting Engineers, a national technical society whose sole objective is the dissemination of technical information in the die casting field. Active members of the Society are individuals from both independent and captive die casting plants. No differentiation is made between independent and captive die casters among SDCE members or those members who are serving on Show Committees. The same is true for the Exposition and Congress, which

Subject	Program Director and Session Leaders	Date	Time
Die Design	Dir.: Earl Mason, Consultants to Industry, Inc. Session Leader: John Caster, Consultants to Industry, Inc.	Tuesday, Nov. 8, 1960	9:30 A.M. to 12 Noon
Die Building	Dir.: Earl Mason, Consultant to Industry, Inc. Leader: John Atols, Atols Tool & Die Co.	Tuesday, Nov. 8, 1960	1:30 P.M. to 4:00 P.M.
Metallurgical Developments	Dir.: Don Colwell, Apex Smelting Company Leader: Wm. Foss, Apex Smelting Company	Wednesday, Nov. 9, 1960	9:30 A.M. to 12 Noon
What's Ahead In Die Casting	Dir.: Don Colwell, Apex Smelting Company Leader: John Wall, Permanent Mold Die Co.	Wednesday, Nov. 9, 1960	1:30 P.M. to 4:00 P.M.
Competition to Die Casting	Dir.: Peter Ponta, Ford Motor Co. Leader: Earl Hovey, Earl Hovey Associates	Thursday, Nov. 10, 1960	9:30 A.M. to 12 Noon
Cost and Profit	Dir.: Peter Ponta, Ford Motor Co. Leader: J. T. O'Reilly, Ford Motor Co.	Thursday, Nov. 10, 1960	1:30 P.M. to 4:00 P.M.
Quality Control	Dir.: William Durako, Crucible Steel Co. of America Leader: Clarence Tice, Delco Remy Div., GMC	Friday, Nov. 11, 1960	9:30 A.M. to 12 Noon
Vacuum Die Casting	Dir.: William Durako, Crucible Steel Co. of America Leader: David Morganstern, Nelmor Manufacturing Co.	Friday, Nov. 11, 1960	1:30 P.M. to 4:00 P.M.

is exclusively designed to provide vital information on products, services and technical developments of broad interest to **both** independent and captive plant management and engineering production executive personnel.

2. Who will attend the Exposition and Congress?

The exhibits in the Show, as well as the technical subjects to be covered in the many papers to be delivered at the Congress, have been selected to provide the broadest possible appeal to the die casting industry. Management of independent and captive die casting and metal working plants, buyers of die castings, die casting engineers, die casting designers and stylists and production executives from die casting and metal working plants will all attend.

3. What is the anticipated attendance?

We expect from 8,000 to 10,000 people to attend the Exposition and Congress over the four-day period. Attendance will be made up of management, supervisory and operating people in the die casting and supplying industries, as well as engineers, designers and stylists from the major industries which consume die castings.

4. What percentage will be advanced registrations?

We estimate that approximately fifty per cent of the attendance will register in advance.

5. What means are being set up to audit the Show?

Registration forms asking for the background of the registrant will be analyzed by the Society of Die Casting Engineers, and a fully detailed report on the make up of the attendance will be issued to all exhibitors after the Show.

6. What acceptance outside of SDCE has been shown for the Exposition?

This Convention has received the complete endorsement of the membership of the Society of Die Casting Engineers, and has been acknowledged by many people outside the SDCE to be a very worthy affair. This latter group includes suppliers to the die casting industry, members of the jobbing die casting industry at large, production executives in many metal working industries including the automotive and appliance field. Several prominent metal working trade publications have accepted the concept of a Convention for the die casting industry with wholehearted enthusiasm, and are planning Show issues.

7. What is the labor picture in connection with the setting up of the Exposition exhibits?

We expect no labor trouble in the setting up and dismantling of exhibits nor in the actual operation of the Show itself. The problems at the A.S.T.M.E. Show in April were the result of an unfortunate jurisdictional dispute brought about by the fact that a contractor retained to perform certain tasks did not have a working agreement with the Carpenter's union. Our overall Show contractors, National Exposition Service, Inc., have been engaged in this line of business for fifty years. Because of their excellent relationships with the unions that will be involved, we fully expect that all major labor problems will be avoided and that the exhibitors will have a satisfactory experience.

8. Will the exhibits consist of displays of machines and processes, or will the flavor of the Exposition be along the lines of architectural displays and pictures?

The majority of the exhibits will be slanted towards technical and management people, and will mainly feature equipment and processes rather than the architectural type of display. Some companies may use photographs to show certain lines of equipment.

9. What is being done to promote the Show?

A continuing publicity program is being carried out in the form of news releases to trade publications, industrial newspapers, general newspapers, and technical societies, promoting the Show and offering up-to-date information. Simultaneously there has also been a continuing direct-mail program to potential exhibitors and attendees, telling them about progress in arranging the Show and generally stimulating interest in the affair. All Chapters of the Society of Die Casting Engineers have been kept up to date on progress through regular reports to special Chapter Show liaison representatives. Word-of-mouth promotion by geographical membership has been an important factor in building interest.

Preceding the Show, and up until Show time, a program of space advertising will be carried out in leading industry trade publications to promote attendance. Such associations as the American Zinc Institute, Aluminum Smelter's Research Institute and the Magnesium Association are lending assistance in the formulation of the Technical Program, and it is expected that each of these three organizations, all of whom have a vital interest in the die casting industry, will have an interest in promoting attendance among their respective memberships.

A direct-mail program soliciting advance registration and booking of hotel space will be carried out well in advance of the Exposition.

10. Who are the exhibitors that are now in the Exposition?

The following list of exhibitors in the Exposition, floor space of which was nearly half sold out within three months of the Show announcement, is growing rapidly. Leading suppliers of products and services to the die casting industry are dominant in the exhibitor listing along with exhibits of both independent and captive die casting plants.

LIST OF EXHIBITORS AS OF JULY 1

Alliance Mold Company, Inc.
Rochester, New York

Aluminum & Magnesium, Inc.
Sandusky, Ohio

Aldridge Industrial Oils, Inc.
Cleveland, Ohio

Apex Smelting Company
Chicago, Illinois

Bendix Aviation Corporation, Bendix Foundries Division, South Bend, Indiana

British Industries Corporation, Shaw Process Development Corp. Division, Port Wahsington, New York

Buhler Brothers Company
Uzwil, Switzerland

The Carborundum Company
Niagara Falls, New York

Celanese Corp. of America,
New York, N.Y.

The Cleveland Automatic Machine Company, Cincinnati, Ohio

Clifford-Rockwell Company
Detroit 35, Michigan

Columbus Automatic Lubrication Company, Columbus, Ohio

Crucible Steel Company of America
Pittsburgh, Pennsylvania

Detroit Mold Engineering Company
Detroit, Michigan

Dodge Steel Company
Philadelphia, Pennsylvania

Dow Chemical Company
Midland, Michigan

Electric Auto-Lite Company
Toledo, Ohio

Ford Motor Company, Dearborn, Michigan, Foundry Division

Foundry Magazine (Penton Publishing Company), Cleveland, Ohio

General Motors Corporation, Ternstedt Division, Detroit, Michigan

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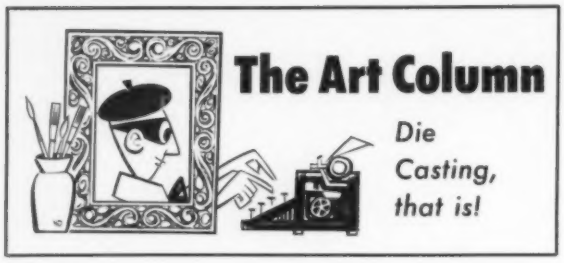


EDITOR'S NOTE: *Here we present another group of ideas. This Art Column was launched in the May issue, with our declaration that it is planned as a continuing, regular feature of Die Casting Engineer, analyzing typical problems of die casters. We repeat our previous urgent invitation to our readers to participate in this department, by giving us their experiences, or writing in to tell us what topics they want taken up. Let's hear from you!*

HAVE YOU EVER tried to blow into a bottle? It is quite an "Art". You may increase the internal pressure somewhat, but about all that actually happens is that you get red in the face.

Well, what does this have to do with the "Art" of die casting? **Die Casting Die Cavities Must Be Vented.** There are many die casters in this country who are getting red in the face, trying to force metal into a cavity from which there are no vents.

As we go around and watch, and as we try to assist in the production of better castings, we are amazed at the number of dies in production in this country that have no vents at all. Most dies have insufficient vents and many dies are being run using a shim around the guide pins in an effort at venting. Here again, may we remind die casters that just as long as the metal is fluid, it must be considered as a hydraulic medium and must be treated as such. All the laws of hydraulics and of flow must be considered.

Back to Basic Laws

Now, when we revert back to one of the basic laws of materials, we know that two objects cannot fully occupy the same space at the same time. Air and gas require space; true, they are compressible within that space, however, they cannot be ignored. Molten metal requires free space if it is to flow and fill that space completely. We cannot accomplish this complete fill of a die cavity with metal unless and until the air and gas have been removed. The air and gas within the die cavity will flow out of the die ahead of the press of metal, provided, of course, that passages are provided for the air and gas to flow. These passages must be of sufficient area and so located, that all the air and gas can evacuate as fast as the metal enters. This location must be such that they are not blocked by the first metal to enter the cavity.

We have found by the use of instruments that for a dry hot die under normal conditions, vents of one-half the area of the gates are sufficient.

However, there are many factors that must be considered. The greater the amount of lubrication and die release material you use on the surface of the cavity, the larger the area of the vents must be to become effective. This amount of die release material is an important variable in the casting quality. It must be carefully controlled in order to achieve uniform casting quality.

Die Surface Temperature Important

The temperature of the die surface is a controlling factor; this is also an important variable in casting quality and porosity. If the die temperature is high enough to quickly dissipate the die release material before closing the die, there is less gas to evacuate ahead of the injected metal. If this die temperature is allowed to fluctuate, then the volume of gas in the cavity will vary. The casting quality as concerns surface condition and porosity will vary.

It has been found that the gas generated from the die release material is often two and three times the volume of the cavity. This must be vented to atmosphere freely or it becomes a part of the casting in the form of porosity and retained gas on the casting surface, causing roughness.

The location of these vents is of the utmost importance. If the metal reaches the area of the vents first it plugs off the vent, thereby rendering it ineffective for the remainder of the filling cycle. This will cause the buildup of back pressure in the unfilled areas even though the vents are of sufficient area.

We found, again with instrumentation, that the most effective location for vents was off the overflow cavities. This accomplishes several things; it makes for unhindered flow into the overflow cavity; it brings the coldest metal to the vent opening; it also makes for the least number of attachments to the casting.

Determining Vent Area

Many die casters, and die builders, are of the opinion that certain people, especially in Europe, have a formula for the determination of size of the vent area. We have questioned many, and we find that many do have a rule of thumb. When these are all carefully analyzed they turn out to be very nearly the same as our instruments indicated. That is, on a hot dry die, approximately one-half the area of the gate. However, many have also learned that if you are operating a cold die you need more vent. If you use a great amount of die release material, you also need greater vent area. By referring to a cold die, this is of course a relative term. The temperature of the die must be hot enough so that all of the gas forming elements of the die release material are dissipated before the die is closed. Any distillent water or oil remaining on the surface of the die will form gas when touched by the hot metal. Therefore, the more free die release material remaining on the die when closed, the greater vent area needed.

We have instrumented the overflow and vent areas of many dies. We have taken records, using different vents, different conformation patterns, different vent location, operated under different temperatures and using different die release materials in various amounts.

Instruments Developed

It might be added that it has been necessary to develop instruments to measure this. We measured both pressure developed and the temperature of the area. These readings must be coordinated with the injection cycle. It was found that the least amount of back pressure was developed when a die was operated with the cavity surface temperature at over 350°F., using a die release material that was readily dissipated at a temperature below 350°F., and using the material in uniform amounts. We found that in this area alone we encountered two important variables.

The best conformation and location of vents proved to be off each overflow cavity, starting the vent at .020"

CONTINUED ON PAGE 26 ■

FIRST NATIONAL
DIE CASTING
EXPOSITION AND CONGRESS
NOV. 8-11

EXPOSITION . . .

■ CONTINUED FROM PAGE 15

Greenlee Brothers & Company
Rockford, Illinois

E. F. Houghton Company
Philadelphia, Pennsylvania

Hydraulic Press Manufacturing Company, Cast-Master Division, Bedford, Ohio

Industrial Manufacturing Corporation
Indianapolis, Indiana

Jervis Corporation
Grandville, Michigan

J. A. Kozma Company
Dearborn, Michigan

Kux Machine Company
Chicago, Illinois

Litemetal Dicast, Inc.
Jackson, Michigan

Lester-Phoenix, Inc.
Cleveland, Ohio

Latrobe Steel Company
Latrobe, Pennsylvania

Lindberg Engineering Company
Chicago, Illinois

Monsanto Chemical Company
St. Louis, Missouri

Manco Products, Inc.
Melvindale, Michigan

Martin Grinding & Machine Works
Chicago, Illinois

Norman Leach Associates
Toledo, Ohio

National Lead Company
New York, New York

Pangborn Corporation
Hagerstown, Maryland

Productive Equipment Corporation
Chicago, Illinois

Prospect Die & Mold Company
Centerline, Michigan

Precision Metal Molding Magazine
(Industrial Publishing Corporation)
Cleveland, Ohio

Permanent Mold Die Company
Hazel Park, Michigan

Renite Company
Columbus, Ohio

Reed-Prentice, Division of Package Machinery Company, East Longmeadow, Massachusetts

Rebmann Products, Inc.
Dearborn, Michigan

Rex-Buckeye Company
Cleveland, Ohio

G. W. Smith & Sons Company, Inc.
Dayton, Ohio

Sterling, Inc.
Milwaukee, Wisconsin

F. B. Stevens, Inc.
Detroit, Michigan

A. Triulzi S.A.S.
Milano, Italy

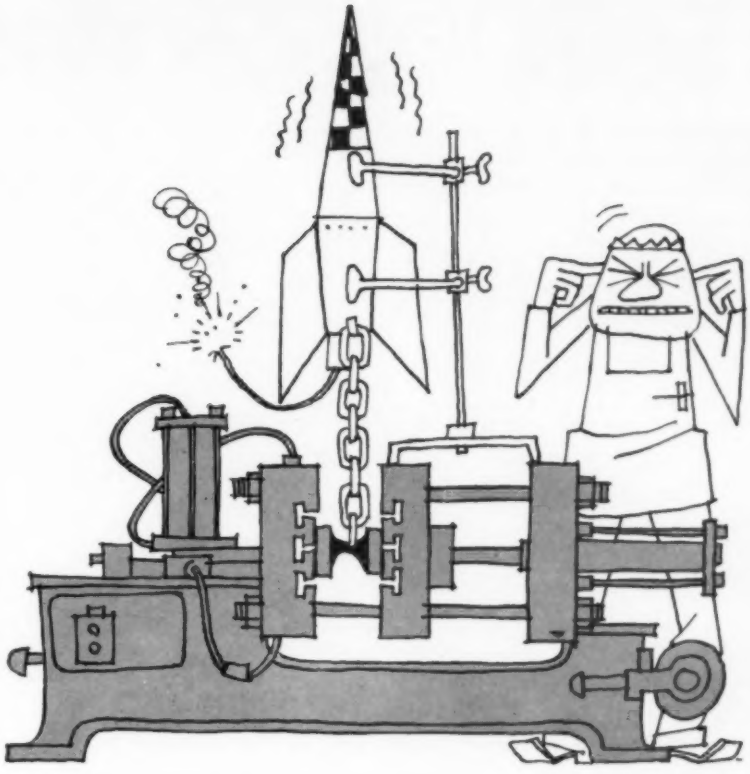
U. S. Reduction Company
East Chicago, Indiana

Univertical Corporation
Detroit, Michigan

Udylite Corporation
Detroit, Michigan

Vesuvius Crucible Company, Swissvale, Pittsburgh, Pennsylvania

Wolverine Die Cast Corporation
Detroit, Michigan



Don't countdown stuck castings...use Die Slick!

If you want to achieve virtually continuous die casting production, you should investigate these two Die Slick compounds: Die Slick No. 9X, for zinc, thins with water to keep your machine ejecting clean castings shot after shot. Die Slick No. 44, for aluminum, thins with water or solvent to eliminate stuck castings, scoring and soldering. Both can be used in a spray gun—and because they thin with water there's almost no smoke.

Water-thinned Die Slick saves you money in several ways. First, you don't need expensive thinners. Second, you eliminate the fire hazard. Third, you save storage space. Send for a trial quantity today . . . either No. 9X for zinc or No. 44 for aluminum. If you don't like it, you don't pay for it, of course.

Die Slick is a registered trade mark of G. W. Smith & Sons, Inc.

for 20 years

DIE SLICK

used by die casters everywhere

G. W. SMITH & SONS, INC.,

1703 SPAULDING ROAD, DAYTON 32, OHIO

CIRCLE 7 READERS SERVICE CARD

NEWS of the INDUSTRY

Manufacturing Engineering Role in America Theme of ASTME Western Show

"America's Success Through Manufacturing Engineering" will be the theme of this year's ASTME Western Engineering Conference and Exhibit in Los Angeles. The show will be staged in the Memorial Sports Arena November 14 to 18.

Concurrently a series of technical sessions will be held at the Ambassador Hotel.

Citing the theme of the show, which is sponsored by the American Society of Tool and Manufacturing Engineers, Harry E. Conrad, executive secretary of ASTME, said:

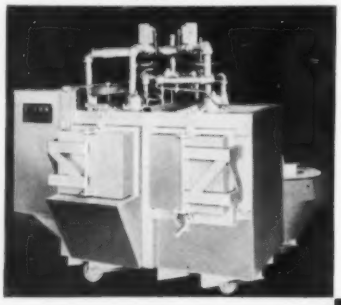
"Industry is becoming more and more aware that America's success is dependent on new developments and their application in industry. ASTME feels their Engineering Conference and Exhibits afford a quick and efficient method of evaluating new developments, processes and products.

KOZMA

NEW! RADIANT ALUMINUM MELTING and HOLDING FURNACES

UNEQUALLED FOR LOW POROSITY ALUMINUM CASTINGS

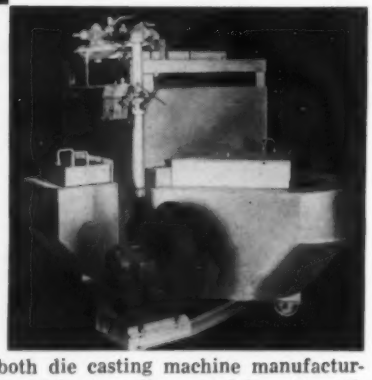
Model RSHCH Melting Furnaces feature the Kozma exclusive "Pre-Temp" charging and sub-surface metal flow virtually eliminating hydrogen pick-up and oxide inclusions, keeping metal at high purity level.



Radiant panel firing provides faster, more uniform heat distribution, eliminates flame impingement and reduces fuel costs. Model RSHCH Furnaces range in capacity from 300 to 2,000 lbs. per hour with design variations to meet your requirements.

MODEL RH HOLDING FURNACES

are specially designed for use with vacuum or non-vacuum aluminum die casting machines. Roller bearing wheels and a unique dipwell permit integral installation as part of the die casting machine. Bath capacities and dipwell design to meet your requirements.



Kozma Melting and Holding Furnaces are being specified by both die casting machine manufacturers and aluminum producers where highest quality metal is a "must".

There is a Kozma Radiant Aluminum Furnace for every melting and holding need. Write today for complete information.

Also available from Kozma—
New Automatic Ladling Unit
Low Cost — Fast — Accurate

INDUSTRIAL PROCESSING FURNACES SINCE 1928

J. A. KOZMA Company
2471 WYOMING
DEARBORN, MICHIGAN

CIRCLE 8 READERS SERVICE CARD

Dow To Equip Laboratory To Assist Its Magnesium Die Casting Customers

Plans for a customer-service laboratory designed to assist the automotive industry and other magnesium die casters were announced by the Dow Chemical Company, Midland, Mich.

The $400,000 laboratory will be equipped to demonstrate the most modern techniques for melting and casting of magnesium, according to William S. Loose, manager of Dow's Magnesium Sales Department. It is expected the laboratory can go into full operation by November 1 at Dow's plant in Midland.

Opening a die-casting laboratory to solve customers' production problems is believed by Dow to be a step unprecedented, not only for a magnesium producer but for the entire nonferrous metal industry.

The company will use the laboratory "to provide prototypes or even an extensive number of parts for customer evaluation in road tests or on proving grounds," Loose said.

"Customers will be able to obtain data on production rates, casting efficiency and related factors in order to determine the basic economics in use of magnesium. The work will be done under conditions simulating actual operations but removed from the demands and schedules of current production in their own plants."

The laboratory will be equipped to carry on research as well as demonstrate the economic and casting advantages of magnesium, Loose said. The research also will work toward further lowering the costs of die casting, a field in which Dow recently made a significant advance with the introduction of a semi-automatic process.

Customers will be invited to send engineering and production personnel to the laboratory for training.

Interstate Engineering New Company Member of SDCE

We welcome as a new company member of the Society of Die Casting Engineers, Interstate Engineering CorporationdePuerto Rico, producers of die castings in Puerto Rico. Mr. Glendon O. Fox, of Chapter No. 35, Puerto Rico, is president of Interstate, and Lennie Roan is plant manager.

NEWS of the INDUSTRY

Vanadium-Alloys Steel Celebrates Its "50th"

Vanadium-Alloys Steel Company on June 2 celebrated its 50th anniversary.

Within five decades, the company has grown from a small producer of crucible-melted tool and die steels to one of America's largest suppliers of tool and special steel to industry.

Vanadium-Alloys has five manufacturing divisions, Canadian and Italian subsidiaries, and affiliates in Italy and France. Today every type of alloy is represented in the many grades bearing Vasco's trademarks. Innovations of the company's research include the "glamor" steels for ultra-high strength at missile and supersonic airplane speeds.

— DCE —

Lester Co. Celebrates Its 25th Anniversary

Lester Engineering Co., Cleveland, celebrated its 25th anniversary on May 29. The company was launched a quarter of a century ago by Nate Lester with, it has been said, "an absolute minimum of capital, but with a wealth of experience and optimism."

In the intervening years, the company devoted itself exclusively to the design and manufacture of aluminum and zinc die casting machines and injection molding machines for thermoplastics.

— DCE —

PDM Quality EJECTOR PINS

1. **Cut DOWN-TIME 50%—75%!**
2. **Proven ability to stand-up better in zinc, aluminum, and magnesium die casting.**
3. **Can be ground from the solid into CORE PINS without rehardening after grinding.**
4. **Complete stock of all fractional & letter sizes 1/16"—1".**

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EJECTOR PINS CORE PINS
CUTTER BLANKS
WATER COOLED SPRUE SPREADERS
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Crushed walnut shells, corn cobs, high grade sawdust and leather fibres for blasting, tumbling, metal finishing.

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Producers of the finest mounted points and wheels for deburring and die barbering.

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United Mineral & Chemical Corp.
A complete line of belts, sheets, rolls and discs on cloth, paper and fiber backings.

CIRCLE 9 READERS SERVICE CARD

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FOR SALE
(OR LEASE)

South Haven, Michigan area. Modern die casting building—5600 sq. ft. or larger if desired, 5 acres of land on good paved industrial street. Up to 8 modern die casting machines of make, type, and size required for aluminum or zinc as desired, will be installed with 30 days guarantee, as well as furnaces and trim presses.

Experienced labor available. Terms up to 10 years or lease can be arranged. Excellent banking facilities.

This is an opportunity with much more possibility than may appear superficially, which will become more apparent upon investigation. We will be located next door for ready servicing. Contact H. Lawson.

We have more than 40 Die Casting machines for sale or lease. All guaranteed—30 days in operation in your plant.

2—Cleveland 400 ton Aluminum. Rebuilt, modernized. $9,500.00
1—Kux BH-30 300 ton Zinc, rebuilt and much modernized, $9,500.00
2—Reed-Prentice No. 1½, 225 ton Zinc, 1950. Rebuilt, fully automatic, $7,500.00

We have them up to 800 ton Zinc and Aluminum and down to the smallest. Pay us a visit.

3—Lindberg Dual Chamber Induction Furnaces 30 KW. 220 Volts. new lining installed by Lindberg, also new coils. Absolutely guaranteed. Offered at half price Ea. $2,750.00
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Gas Furnaces of all sizes.

DIECASTERS' EQUIPMENT DIVISION
MAGNESIUM INDUSTRIES, INC.
1313 Kalamazoo St., South Haven, Michigan. Tel. 1163

CIRCLE 11 READERS SERVICE CARD

********** NEW IDEAS-NEW PRODUCTS **********

Dry Lubricant Stick Affords Simple Application

▲ Extreme pressure molybdenum disulfide dry lubricant in stock form now is available from The Alpha-Molykote Corp., 65 Harvard Ave., Stamford, Conn.

Resin bonded for greater strength, the Molykote lubricating stick permits easy application of a lubricating film to cutting and shaping tools, sliding areas of small and medium size machine parts, or wherever metallic dry friction occurs on sliding surfaces. Application is simple, the stick just being rubbed firmly over the cleaned surface.

CIRCLE 13 READERS SERVICE CARD

—— DCE ——

New Vibratory Barrel Tumbling Machine

▲ Vibratory barrel tumbling machines featuring electromagnetic vibratory drives for deburring, cleaning, descaling, or most any parts finishing job, have been developed by Syntron Company, 1311 Lexington Ave., Homer City, Pa., as a new concept in the art of parts finishing.

Powerful, controlled directional vibration keeps both parts and media agitated constantly, assuring more thorough working of hard-to-get-at and shielded area.

Self-contained, compact units, designed to reduce parts handling, available in three models with .4, 1 and 6 cu. ft. barrel capacities.

CIRCLE 14 READERS SERVICE CARD

—— DCE ——

New, All-Around, Portable Test Instrument Offered

▲ Easy testing of all materials such as metal, plastics, textiles, wire, springs, leather, etc., is claimed for the new all-around Model M tester offered by W. C. Dillon & Co., Inc., 14620 Keswick St., Van Nuys, Calif.

Simple changes in grips quickly adapt the basic instrument for tests of tensile, compression, transverse and shear forces. Operation is by means of a calibrated pendulum — guaranteed accurate within ½ of 1% of indicated reading in accordance with A.S.T.M. requirements.

CIRCLE 15 READERS SERVICE CARD

—— DCE ——

New Graphite Spray Can Efficient "Dry" Lubricant

▲ Top efficiency because of the even dispersion gained through aerosol application is reported for Sprayon No. 204 Dry Graphite Lubricant, according to the maker, Industrial Supply Division, Sprayon Products, Inc., Cleveland, Ohio.

This lubricant is claimed ideal for die casting machines, bearings, locks, conveyor parts, flat springs, hinges, oven parts and the like. It also is recommended for pre-assembly of moving parts.

CIRCLE 16 READERS SERVICE CARD

—— DCE ——

New Manual-Reset Type Safety Shut-Off Valve

▲ When connected with one or more safety circuit breaking instruments and installed in gas or oil supply lines leading to the burners of industrial boilers, furnaces, ovens, kilns, and other processing equipment, the new Maxon SERIES 800 Manual-Reset Valve shuts off flow of fuel automatically and instantly upon any break in the electric power or safety circuit. Manufactured by Maxon Premix Burner Company, Muncie, Indiana.

CIRCLE 17 READERS SERVICE CARD

REDUCE COSTS WITH

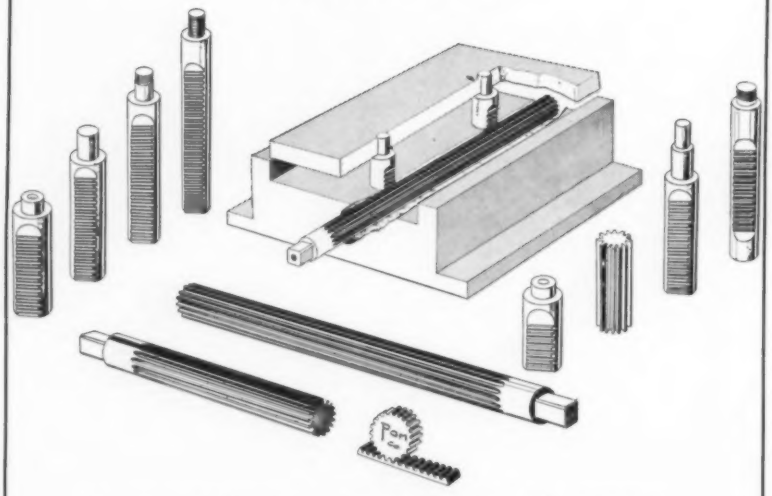
PEERLESS *"FLAME-A-LOY"

PINIONS & RACKS

FOR

DIE CASTING MOLDS *PERMANENT MOLDS*

PLASTIC MOLDS



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W. GENEVA AVE.

DUNKIRK, OHIO

Phone: 3101

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CIRCLE 12 READERS SERVICE CARD

********** NEW IDEAS - NEW PRODUCTS **********

Chamfering and Deburring Tool Features New Lip Form

▲ A chamfering and deburring tool, termed Roto-Burr, that is said to incorporate all the advantages of single lip construction into a tool that has a truly new lip form, is announced by Jancy Engineering Co., 508 S. Pine St., Davenport, Iowa.

Easy to regrind, the sharpening requires a minimum of equipment and time.

CIRCLE 18 READERS SERVICE CARD

— DCE —

Tracer Stylus Sets With Square or Ball Nose

▲ Tracer stylus sets have been added to the line of tracer accessories offered by True-Trace Corporation of El Monte, Calif. The stylus sets are for use with 360 degree and 3D duplicating and are available with round nose for ball end mill work or square nose for flat end mills. Each set contains 30 stylii (.125 diameter to 1.062 diameter) and is packed in a hardwood case. Stylii are hard chrome plated and come with .3750 shank diameter.

CIRCLE 19 READERS SERVICE CARD

— DCE —

TECHNICAL LITERATURE

Denison Issues Bulletin on Hydraulic Components

■ A new six page bulletin describing components designed for hydraulic systems up to 5,000 psi has just been published by Denison Engineering Division, American Brake Shoe Co., Columbus, Ohio.

A wide range of pumping units, vane and axial piston fluid motors, flow control valves, check valves, pilot operated pressure control valves, directional control valves, remote control valves and electro-hydraulic pressure control valves are reviewed.

CIRCLE 20 READERS SERVICE CARD

Edwin Meyer New SDCE Member from Buenos Aires

A welcome new member of the Society of Die Casting Engineeers is Edwin Meyer, Argentine Chapter No. 36. He is director general of **Tameyfu S.R.L.**, producers of die castings, Av. Fondo de la Legua 1058, Martinez, Buenos Aires.

Mr. Meyer has been visiting die casting plants throughout the country and was a recent visitor in Detroit. After a trip through the East he will return to Argentina, but plans to return to the United States later to attend SDCE's First National Die Casting Exposition and Congress.

Burton Silverplating Issues Facilities Brochure

■ A new, pictorial facilities brochure is now available from Burton Silverplating Company, 11240 Playa, Culver City, Calif., which claims to be the West's largest specialist in plating on metallic and non-metallic substances with gold, silver, rhodium and platinum. The brochure outlines their services, facilities and personnel and sketches the history of the company's growth.

CIRCLE 21 READERS SERVICE CARD

— DCE —

New Bulletin Describes Complete H-P-M Press Line

■ A 16-page bulletin describing the entire H-P-M line of press equipment for pressure processing is available from the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, a division of Koehring Company.

CIRCLE 22 READERS SERVICE CARD

...Rejects knocking your profits for a loop ?

The alloys you're using may be at fault—

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For good casting results your alloys must fulfill a considerable number of specific requirements. For instance, good fluidity to reproduce fine detail, fill out thin sections; stable properties to yield good surface texture, provide adequate mechanical strength; plus all the particular qualities to meet your casting needs.

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Write TODAY for Henning's ALL-NEW "Reference Book and Guide on Zamak (Zinc Base) Die Casting Alloys." It gives valuable production and design data for die casters and engineers . . . and it's yours for the asking.

YOUR CASTINGS CAN BE NO BETTER THAN THE ALLOYS YOU USE.

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CIRCLE 23 READERS SERVICE CARD

PEOPLE IN DIE CASTING

Bollman Heads Marketing Committee of American Die Casting Institute

• **Harry Bollman** has been named chairman of a newly formed marketing committee of the American Die Casting Institute by President Gordon C. Curry.

The committee's purpose is to investigate promotional, advertising and sales methods of die casting producers to protect die casting users from misrepresentation as to quality, safety and standards. In addition, the committee will actually promote the ADCI member custom die caster as the sole reliable source of quality die castings.

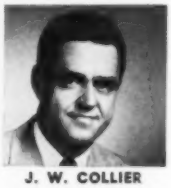
—— DCE ——

• **William A. Dameral** of Farmington, Conn., has been appointed Director of Purchases for the Package Machinery Co. of East Longmeadow, Mass., it was announced by Roger L. Putnam, Jr., executive vice president of the company, of which Reed-Prentice is a Division.

Following services with Sperry Products, Inc., and Maxim Silencer Co., Dameral joined Whitney-Chain Co. in 1947 as an executive in their sales department. After several years in sales he became Assistant to the President. In 1955 he was given the important task of setting up a newly activated product line for the company.

—— DCE ——

E. E. SIGG



J. W. COLLIER

• **Edward E. Sigg** has been named vice president for manufacturing of Mechanical Specialties Company, Los Angeles, according to Lawrence M. Weitzel, president. Sigg recently returned to the company which he had served for 11 years, after a 14 month tenure as shop superintendent for the Dunkle Tool and Die Company of Los Angeles.

—— DCE ——

• **Joseph W. Collier** has been named chief industrial engineer by Latrobe Steel Co., reporting to R. T. Eakin, vice president in charge of operations for the local producer of tool, die and specialty steels. Previously Mr. Collier was assistant industrial engineer, for more than 12 years, at the Crystal City, Mo., plant of Pittsburgh Plate Glass Co.

—— DCE ——

• **Robert D. Beatty, Jr.,** has been appointed a staff representative on special assignments with Eaton Manufacturing Company, according to Wm. A. Mattie, vice president-administrative.

He then became pres. of Manor Die Cast Corporation. The firm was sold to Rockwell Manufacturing Company of Pittsburgh last November, and Beatty did consulting work in the field of engineering until rejoining Eaton recently.

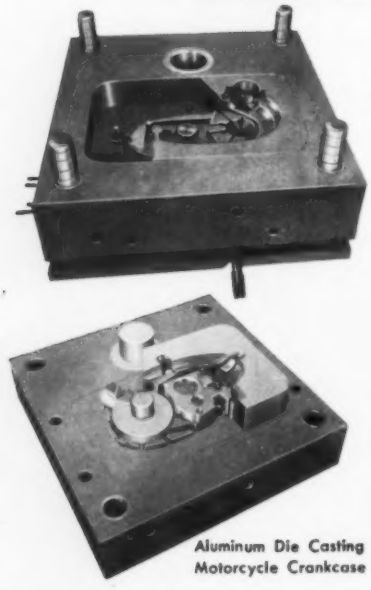
—— DCE ——

• **Walter T. Miller** has been named Chicago District Sales Manager of Bohn Aluminum & Brass Corporation (Detroit), according to R. C. Aylward, vice president of sales. Miller will supervise sales in Greater Chicago, northern Illinois and Iowa, of all of Bohn's product line except heat transfer product.

—— DCE ——

• **Wesley H. Hauschilt** has been appointed chief production engineer for aluminum operations in the foundry operations in the Foundry Department of the Bay City, Mich., plant of the Dow Metal Products Company.

Reliable as a Japanese Camera . . . JDE Die Casting Dies



Aluminum Die Casting Die - Motorcycle Crankcase

The Toolmakers of Japan

In fact, many leading models of Japanese cameras, which are appreciated overseas for their reliable performance, are cast in parts with JDE Die Casting Dies.

In fact, not only cameras but also motorcycles, electric fans, sewing machines and other Japanese products, which are enjoying worldwide appreciation for their everyday reliability, are, in many cases, cast in parts with JDE Die Casting Dies.

In fact, JDE Die Casting Dies have cast extra-close tolerances, intricate special shapes, super-fine finishes and many other valuable qualities - on a most competitive basis - into these and other parts in which reliability is critical.

Now, the JDE Group, the finest - and largest - group of diemakers in Japan, is ready to serve your difficult tool needs, with its staff of 137 engineers and 1,004 toolmakers operating 746 major machine tools in 14 tool shops.

On your tool problems, particularly those demanding an unusual amount of skilled workmanship, write to,

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CIRCLE 24 READERS SERVICE CARD

CORE PULLING

■ CONTINUED FROM PAGE 11

External locks are much easier to adjust, but offer the disadvantage of having only the strength of the bolts to resist the shot pressures. The holding power of the external lock can be improved by making the lock flush with the die block surface, as shown in Fig. 2. When the die is clamped in position the lock is supported by the machine platen, causing the fulcrum point to be at "F", which improves the mechanical advantage. The external lock may also be supported by piloting into a support block attached to the ejector die.

There are times when the loading is light where it is permissible to use the operating cam as a lock, as in Fig. 3.

The above locks use the motion and locking pressure of the machine and the angle of the lock for holding power. When fitting locks, a diemaker should fit locks with a slight interference, so as the machine is closed, the bolts and the supporting steel are pre-stressed prior to making the shot.

Hydraulically Operated Wedges

Hydraulically operated locking wedges are used on cover die core pulls, on steep angle pulls, and other special applications where the closing of the machine cannot be utilized to an advantage, see Fig. 4.

Any combination of the aforementioned mechanics may be used to produce the desired effect. To select the proper design for any given part, we must consider the production requirements of the die, dimensional tolerances allowed, temperature control lines, replacement and maintenance of the core and its operating mechanism, die size limitations, and die cost. We must also consider the slide parting line effect on subsequent operations on the casting.

SDCE SUPPORTING COMPANY MEMBERS

SUSTAINING MEMBERS

American Mold Engineering Co.
Atols Tool & Mold Corp.
Braeburn Alloy Steel Corp.
Cast-Master, Incorporated
Chrysler Casting Plant, Chrysler Corporation
Clinton Engines Corp.
Congress Die Casting Division, The Tann Corp.
Crucible Steel Company of America
Cuyahoga Industries
Dodge Steel Company
Double A Products Company
J. R. Elkins, Inc.
Process Development Section
General Motors Corporation
Kux Machine Co.
Latrobe Steel Company
Lester Engineering Co.
Permanent Mold Die Co., Inc.
Reed-Prentice Division, Package Machinery Co.
Universal Die Casting Division,
Hoover Ball & Bearing Co.

COMPANY MEMBERS

Alignment Engineering Co.
All State Industries, Inc.
Aluminum Die Cast Foundries, Inc.
Atlantic Chemicals & Metals Co.
B & K Tool Co.
B & T Machinery Company
Briggs & Stratton Corp.
Central Die Casting & Mfg. Co., Inc.
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Columbia Engineering Co.
Conneaut Die Casting Co.
Detroit Mold Engineering Co.
Disdie Steel, Incorporated
Dominion Die Casting Ltd.
Dort Manufacturing Co.
Formax Mfg. Corp.
Johnson Motors, Outboard Marine Div.
Gasser Engineering Co.
Girard Mfg. Company
Grand Rapids Die Casting Co.
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Irrigation Equipment Co., Inc.
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R. Lavin & Sons, Inc.
Lindberg Engineering Co.
Lindberg Steel Treating Co.
Martin Grinding & Machine Works, Inc.
Northern Tool & Die Co.
Ostrom Tool Company
Prospect Die & Mold, Inc.
Quad-City Die Casting Co.
Roth Smelting Company
Frederic B. Stevens, Inc.
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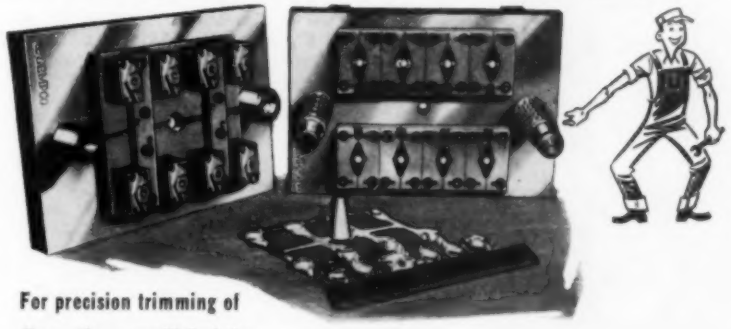
Hawthorne Works, Western Electric Co.
Wabash Smelting Inc.
Western Electric Co., Inc. (Baltimore)
Western Electric (Chicago)
Wico Electric Co.
Charles Zapf & Co.

CUT YOUR TRIMMING COSTS!



For precision trimming of die castings, you'll find the famed Lempco Ball Bearing die-mating principle is the best way to get a CLEAN CUT without excessive and costly hand finishing. That's because of the rigidly accurate guidance provided by hardened and ground pins and bushings mating under a .0015" ball bearing preload. Mount your trim dies in a Lempco Ball Bearing Precision Die Set and maintain exact alignment for millions of strokes, with minimum maintenance.

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CIRCLE 25 READERS SERVICE CARD

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PRETEMPERED AND HOT WORK STEELS FOR DIE CASTING AND EXTRUSION TOOLS
ALL SIZES IN STOCK
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UNIT DIES

■ CONTINUED FROM PAGE 7

3. Set of matched replacement units with leader pins, ejector plates and return pins installed.

The complete standard assembly shown here has six leader pins and bushings, two in each replacement unit and two permanently installed in the Unit Die holder. Some unit dies have standard core pull brackets mounted on the sides as part of the unit. With the type of assembly pictured here three sides of the standard unit can be equipped with slides, (See Fig. 3) the fourth side is inaccessible because it contains the sprue and gate runner.

Original Headaches Eliminated

Some of the original headaches, which have been eliminated through good Unit Die design and construction, were:

1. Difficulty of removing dies.
2. Units would rust and freeze in the master unit holder.
3. Limitation of size due to ejection.
4. Improper heat treating of slides caused galling.
5. Loose dimensional tolerances, making fast interchangeability difficult.

With the above difficulties a thing of the past, the odds are all in favor of using Unit Dies for both short and long run production.

However, to successfully operate a Unit Die it is desirable to maintain a relationship between the two or more parts being cast. The casting weight, casting section thickness, gate area, and gate thickness must be similar.

When production schedules call for only one part, it is necessary to operate a large machine to produce a small part.

These disadvantages are generally overcome when the die caster has enough Unit Dies to schedule production so that he can match the parts cast in any one holder.

Chapter News . . .

Formal Chapter meetings having been discontinued for the summer, we have no activities to report in this issue of DIE CASTING ENGINEER. However, while SDCE members maintain contacts chiefly through golf outings, plans are being formulated for informative technical sessions with the resumption of dinner meetings in the fall.

Have a happy summer!

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DIE CASTING
EXPOSITION
AND CONGRESS
NOV. 8 - 11

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Trim Dies

14560 LESURE
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CIRCLE 28 READERS SERVICE CARD

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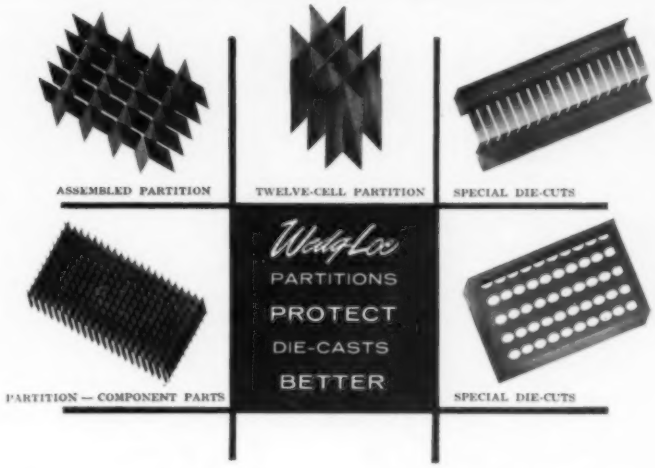

WEDG-LOC CARDBOARD PARTITIONS, DIE-CUTS, AND PADS protect polished and plated die-cast parts from scratching. They reduce packaging time, and assure accurate count.

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CIRCLE 29 READERS SERVICE CARD

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No. 2

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Zinc Ball Anodes

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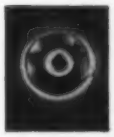
Searching for

CLEANER

Die castings?
Dies & Machines?
Air and Odor?

LONGER LIFE . .



from Die Plungers, Cylinders & Sleeves?

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Send for samples & technical data.

ALDRIDGE INDUSTRIAL OILS, Inc.

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CIRCLE 32 READERS SERVICE CARD

THE ART COLUMN

■ CONTINUED FROM PAGE 16

thick and tapering it to .005" or .007". The .005" or .007" thick portion of the vent passage should be the last full inch of the length of the vent passage.

The vent passage may be started at the .020" thickness by the width necessary to give the required area. It may then be fanned out to give sufficient area and cooling contact.

The vents must be kept clean. Overflow, flash, or solidified material, will act as a very effective plug to your vent system, and will do much to cause casting variables.

When venting from your overflow area, you must study your flow into the cavity and make sure that the metal reaches your overflow and thus your vent last, and in the final phase of cavity filling.

Vents In Final Fill Area

Overflows and vents need not be located at the top of the cavity; they are effective as vents only when located in the final fill area, regardless of where that area is. However, if possible, the top of the die is a good location as it allows you to take advantage of the thermal properties of the die; also, air and gas seek the highest point of the die cavity.

The comfort of the operator should be considered. This is another reason for the top location; hot gas and metal vapor are directed away from the operator.

The die caster must remember he need not get red in the face; all he must do is to treat his metal as a hydraulic medium; allow his cavity to evacuate, go easy on his die release material, keep it uniform, and keep his die temperature up and also uniform. Control these known variables.

RENELL, INC. Designers and Builders

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LEFT AND RIGHT HAND FROM EITHER IMAGE

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DESIGNERS AND BUILDERS

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DIE CAST DIES STAMPING DIES
SPECIAL MACHINERY
JIGS FIXTURES

CIRCLE 35 READERS SERVICE CARD

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July, 1960

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Company ..... *Kind of Business* .....

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
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49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
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97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144

INSIDE FRONT COVER **INSIDE BACK COVER** **BACK COVER**

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for larger steel sections

serving better production of our first quality tool steels

(and our customers' special forging needs)

CAPACITY	2000 Tons
WORKING PRESSURE	4250 psi
STROKE	48"
DAYLIGHT	108"
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(left to right)	90"
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LATROBE, PENNSYLVANIA

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